CULTIVATED JUSTICE: A MODEL FOR PLACE-BASED COMMUNITY BUILDING

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SPRING 2016

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree in Architecture
with honors in Architecture

Reviewed and approved* by the following:

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Honors Adviser

* Signatures are on file in the Schreyer Honors College.
CULTIVATED JUSTICE
a model for place-based community building
In 1776, the founding fathers established America based on the inalienable human rights of life, liberty, and the pursuit of happiness. We pride ourselves on being part of a democratic and capitalistic system, where freedom reigns. However, we know all too well the bleak reality of exploitation and exceptionalism in our country, beginning with the abuse of natives, and continuing with immigrant workers today.

The passage of the National Labor Relations Act in 1930s ensured acceptable living standards for industrial workers, but this act excluded agricultural workers. It was not until the late 1970s that some NLRA provisions extended to select farmworkers. Virtually all legislation during the New Deal period excluded agricultural workers, including laws that regulated workplace safety, minimum wage, child labor, and maximum working hours. Even today, most farmworkers live beyond the reaches of modern labor laws, especially immigrant workers.

Despite the growing profits of American agribusinesses, farmworkers continue to live in unacceptable conditions, cut off from their families, culture, and dignity. The well being of humanity should be our fist priority as a society and as architects. My thesis provides migrant mushroom farmworkers in Kennett Square, PA with shelter, community, inter-generational sustainability, and dignity. I believe in a systemic model that can intervene in the retrograding cycle of worker exploitation, and create hope and dignity for these agricultural workers.

Migrant workers need a community where they can lay down their roots and cultivate rich lives, in homes are rooted in place and permanence. This community will empower its participants for growth, investment and self-improvement. By helping to grow the building materials for their homes, residents build their futures and help others do the same.
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Area of Focus Summary

Research for this thesis probes the social, political, and economic systems at play in Pennsylvania mushroom agribusiness. The social body of research extends in many directions, but primarily draws on the admonitions of the 1987 UN Bruntland Report, The Equitable Food Initiative, and Architecture for Humanity’s Cameron Sinclair. Also forming a social foundation for this project is the research of human dignity expert Donna Hicks.

Policy research for this thesis investigates the number of political factors at play. This includes understanding the rights of farmworker unions, agribusiness law, American labor laws, the extents of federal funding for farmworker housing, and the limitations of migrant worker laws. Summaries and shortened sections of these legal policies prove useful for understanding the foundation of agricultural labor policy.

Investigations into building materials and methods began with precedent studies, continue into manufacturing and construction methods, and the architectural possibilities of mycelium building materials.

Key Terms Defined

**ORGANIC** - derived from living organisms, characterized by systematic arrangement of parts

**HUMANITARIAN** - having concern for or helping to improve the welfare and happiness of people

**DIGNITY** - state or quality of being worthy of honor, “the quality by virtue of which every person is to be treated as an end and never merely as a means”

**MIGRANT** - a person who moves from one place to another place to work
Literature Review

THE HUMAN COST OF FOOD, 2002

The Human Cost of Food, compiled Charles Thompson and Melinda Wiggins, contains first hand accounts, professional essays, and address from the “Sowing Seeds for Change” symposium in 1998. The book chronicles the challenges of farmworkers, covering topics in health, housing, education, law, and politics. Each contribution to the book investigates one issue that farmworkers face, and symposium addresses break up the scholarship with emotional first hand accounts, songs, and poems. The Human Cost of Food aims to enlighten readers on the issues farmworkers face and how advocates can reach for justice in different areas.

OUR COMMON FUTURE, 1987

Our Common Future is, primarily, the transcript of Gro Harlem Bruntland’s 1987 World Commission on Environment and Development to the General Assembly of the United Nations. The book also includes a foreward from Bruntland and an overview of his commission. His task as chairman was complex: to come up with standardized long-term ways to improve environmental sustainability and development by 2000 and unite developing and developed countries in concern for the environment. After 5 years, Bruntland published this “global agenda for change,” which posits the importance of both environmental and humanitarian development and protection. He aptly defines many issues at play in the world of humanitarian aid, and brings to light the importance of social and environmental sustainability.

THE DIGNITY OF WORKING MEN, 2000

This book investigates the lives and experiences of blue-collar and middle class working men through extensive interviews and social research. In the context of declining living conditions, and limited economic success, Michele Lamont examines how these men construct their ideas of self-worth, working hierarchy, and social differences. In his introduction, Lamont says they generally define their self-work in the ability to exercise personal discipline, responsibility, and provide for their families, rather than in economic terms. The first section of this book examines the defined boundaries of constructed social orders and their associated norms, which join and separate groups of people. Lamont defines the hierarchy of principles that working men view use to classify and identify others within the working class system. He also addresses the unpredictable definition of the ‘outsider,’ as it depends on racial and cultural associations.
In Defense of Human Dignity, 2003

In Defense of Human Dignity, curated by Robert Kraynak and Glenn Tinder, discusses how modern times complicate the concept of human dignity. Based on Tinder’s essay, “Against Fate: An Essay on Personal Dignity,” the other essays in the collection respond to and expand upon Tinder’s proposal to revive the inherent value of individual dignity. On the whole, the book investigates what entitles humans to dignity, and the extents and definition of that dignity. In Defense of Human Dignity gives me a framework on which to build my theoretical and programmatic decisions.

With These Hands, 1998

Daniel Rothenberg spent years with migrant workers and engaged with their culture to learn about their lives, struggles, and experiences. He also got to know crew leaders, landowners, and presidents. With These Hands “is an extraordinary documentary study of American migratory farmworkers.” Similar to The Human Cost of Food, each chapter in this book covers a distinct common experience of farmworkers. With These Hands also includes first-hand accounts and beautiful images of Rothenberg’s experiences. Robert Coles says in his foreword that the book not only provides us with vivid social document, but also with moral chronicle of the sufferings and triumphs of the people who provide us our food. This will serve to enlighten me to the experiences of the workers that came before those I will meet, so I can better understand the history of migrant labor in America.

The Agrarian Origins of American Capitalism, 1992

Allan Kulikoff provides my project with an informative and comprehensive history of America’s capitalist system in terms of demographic and economic data. He proposes a new model for rural development that covers time, place, and class. It describes the growth of small farmers, artisans, and slaves into capitalist landowners and wage workers. Kulikoff argues that capitalism changed our society in countless ways, including class structure, gender roles, immigration, resource allocation, and government structure. He cites Karl Marx as the main influence on his socio-economic framework, which addresses class struggle and materialism. This book will add specific economic background to the sustainable business cycle I will propose for my project.
This diagram links the 10 essential elements of human dignity as described by Donna Hicks, and the three elements
This diagram lays out the issues discussed in *The Human Cost of Food*. This book has proven to be an invaluable resource for understanding the struggles migrant workers face, and the history, implications, and intricacies of the issues.
A preliminary and simplified business model for organic self-sustaining building processes and company operation
11 Architectural Precedents

Body Text

Butaro Doctors’ Housing, MASS Design Group
Izola Social Housing, OFIS Arhitekti
Mieres Social Housing, Zig Zag Architectus
Tsunami Reconstruction, Sheigeru Ban
BONDY, Guerin Pedroza Architects
Housing Projects, MDW Architecture

Valenton Housing, Gelin-Lefon
St. Agatha Berchem Housing, Buro II
Rue du Retrait, Atelier Phileas
Migrant Worker Housing, DesignCorps
Social Housing, Vousetes ici Architectes
“THE MUSHROOM CAPITAL OF THE WORLD”

**Existing Conditions of Farmworker Housing**

- **47%** of America’s mushrooms produced in Kennett Square, PA
- **400 Million** pounds of mushrooms produced in Kennett Square, PA each year
- **$365 Million** value of mushrooms produced in Kennett Square, PA each year
- **10,000** mushroom farmworkers employed in Kennett Square, PA
- **$12-18K** average national income for agricultural workers
- **7-21 Years** average stay of a mushroom farmworker in Kennett Square, PA
- **24/7 365** growing season for cultivated mushrooms
- **60 Hours** average hours worked each week by mushroom farmworkers

**Migration Patterns of Hired Farmworkers**

- **Annual Back to Mexico**
- **Annual Birth to Mexico**
- **Shuttler**
- **Settled**

**Average Listing Price in Kennett Square, PA**

- 8/12/15: $510,000
- 8/19/15: $520,000
- 8/26/15: $500,000
- 9/2/15: $490,000
- 9/5/15: $480,000
- 9/8/15: $470,000

**Growing Season for Cultivated Mushrooms**

- 47% of America’s mushrooms produced in Kennett Square, PA

**Average National Income for Agricultural Workers**

- Newcomer Shuttler
- Follow Crop
- Settled

**Average Listing Price in Kennett Square, PA**

- $520,000
- $510,000
- $500,000
- $490,000
- $480,000
- $470,000

**Average Hours Worked Each Week by Mushroom Farmworkers**

- 60 Hours

**Average National Income for Agricultural Workers**

- **$12-18K**

**Kennett Square, PA Population by Race**

- Hispanic or Latino 42%
- White 42%
- Asian 1%
- Black or African American 1%

**Average National Income for Agricultural Workers**

- **$12-18K**

**Migration Patterns of Hired Farmworkers**

- **Annual Back to Mexico**
- **Annual Birth to Mexico**
- **Shuttler**
- **Settled**

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**Migration Patterns of Hired Farmworkers**

- **Annual Back to Mexico**
- **Annual Birth to Mexico**
- **Shuttler**
- **Settled**
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>84%</td>
<td>Border fields where pesticides are used</td>
</tr>
<tr>
<td>38%</td>
<td>Of homes surveyed were “severely inadequate”</td>
</tr>
<tr>
<td>79%</td>
<td>Exposed to the elements due to major exterior problems</td>
</tr>
<tr>
<td>36%</td>
<td>Have children living in the household</td>
</tr>
<tr>
<td>30%</td>
<td>Have major structural problems</td>
</tr>
<tr>
<td>30%</td>
<td>Dormitories or barracks</td>
</tr>
<tr>
<td>32%</td>
<td>Mobile homes</td>
</tr>
<tr>
<td>27%</td>
<td>Have failing structural members</td>
</tr>
<tr>
<td>25%</td>
<td>Have access to laundry facilities</td>
</tr>
<tr>
<td>7%</td>
<td>No access to indoor toilets</td>
</tr>
<tr>
<td>95%</td>
<td>Owned by public or private agencies</td>
</tr>
<tr>
<td>1,566</td>
<td>Single family units in the eastern migrant stream surveyed by HAC and FHSI</td>
</tr>
</tbody>
</table>
4/1045 KAOLIN ROAD, KENNETT SQUARE, PA
Aerial Photos & Maps of Site
Site Documentation

The site is a 24.32 acre lot in Kennett Square, Pennsylvania. A sister lot sits across an access road; both sites are green, open fields with heavily-wooded property lines. The proposed site is in an R-3 zone. It can be subdivided into up to 12 lots of varying acreage, and is less than one mile from the Phillips Mushroom Farm and three miles from the Oakshire Mushroom Farm.
Kennett Square is located in Chester County, Pennsylvania, one of the most scenic and historical counties in the state. It is one of the three original counties created in Pennsylvania by its founder, William Penn. Located outside of Philadelphia and Wilmington, residents of the county have one of the highest median incomes in the country. Many know Chester County for its beautiful scenery, including the Brandywine River, Longwood Gardens and vast farmland.
Site Parameters

R-3 - Residential Zoning - Multiple family residential
Maximum Density 1:3,000 units/sf
20’ front setback, 6’ side setback, 25’ rear setback
33% maximum lot coverage
40’ maximum building height (main building)
16’ maximum building height (accessory buildings)

The graph at left shows the migration patterns of hired farmworkers in the U.S. in a 20 year span. The trend shows an increased number of settled migrant farmworkers. This indicates a growing need for farmworker housing communities.

The chart at left shows the population of Kennett Square, Pennsylvania divided by race. The total population of the town is 6,129 (2013). This calculates to around 2,574 people that are either Hispanic/ Latino or White. Many of the Hispanic or Latino residents work on mushroom farms in the area.

Employment of Farmworkers by State (farm, ranch, and aquacultural animals) May 2014
5//MYCELIUM MATERIAL STUDIES

What it is

A combination of mycelium spores and organic farm waste (such as corn husks, bovine, wheat, sugar cane, rice, hemp, or jute byproducts) placed in a customized mold in varying climactic conditions. Mycelium material can be used as a structural material, building insulation, and as interior finishes.

How it works

Hyphae are mushroom spores, which, when grown in the correct conditions, will create a complex mycelium root system. In the material, the mycelium fungus acts as a binding agent; it digests cellulose fibers provided by the organic farm waste.

Material Qualities

Chitin forms both the shells of insects and the surface of mushroom bricks. It is incredibly hard, shatter resistant, and handles compression well. It is also water, fire, and mold resistant.

Mass Production

The Oakshire mushroom farm in Kennett Square, Pennsylvania currently produces mycelium materials on a large scale for shipping and experimentation purposes.
The Growing Process

1. Get agricultural waste from regional farms
2. Clean waste and introduce mycelium
3. Bag the mixture and let it grow for 2-4 days. The mycelium digests the cellulose in the waste and forms a matrix of white fibers.
4. Once all organic particles are coated in the mycelium matrix, they are broken up into loose particles again.
5. Molds of the desired shape
6. The bags of broken up mixture are placed in molds
7. The fungus grows in a dark, high-humidity environment for 2-5 days until it completely digests the sawdust and solidifies again
8. Bricks are dried out with fans, dehumidifiers, and heaters
9. A brick with fungus attached
### Material Specifications

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Mycelium Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Density</strong></td>
<td>-</td>
<td>80-130 g/L</td>
</tr>
<tr>
<td><strong>Thermal Resistance</strong></td>
<td>ASTM D2844</td>
<td>R 3.6 per inch</td>
</tr>
<tr>
<td><strong>Compressive Strength</strong></td>
<td>ASTM D695</td>
<td>55-100kPa</td>
</tr>
<tr>
<td><strong>Compressive Elastic Modulus</strong></td>
<td>ASTM D695</td>
<td>690-1034 kPa</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>TGA Test</td>
<td>Stable to 340°C</td>
</tr>
<tr>
<td><strong>Fire Resistance</strong></td>
<td>ASTM E84</td>
<td>Class A Firewall</td>
</tr>
<tr>
<td><strong>Flame Spread</strong></td>
<td>ASTM E84</td>
<td>20</td>
</tr>
<tr>
<td><strong>Smoke Developed</strong></td>
<td>ASTM E84</td>
<td>50</td>
</tr>
<tr>
<td><strong>Aldehyde and VOC Emissions</strong></td>
<td>ASTM E1333</td>
<td>&lt;0.01-0.03 ppm</td>
</tr>
<tr>
<td><strong>Water Vapor Transmission</strong></td>
<td>ASTM E96</td>
<td>30 US Perm, Class 1 Vapor Retarder</td>
</tr>
<tr>
<td><strong>Mold Resistance</strong></td>
<td>ASTM C1338</td>
<td>Pass</td>
</tr>
<tr>
<td><strong>Water Absorption</strong></td>
<td>ASTM C1134</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Airborne Sound Transmission</strong></td>
<td>ASTM E1050</td>
<td>0-6300 Hz</td>
</tr>
</tbody>
</table>
Panel Construction

1. Steel frame constructed
2. Wood grid placed in steel frame for internal reinforcement
3. Wood cross bracing placed in steel frame for lateral bracing
4. Necessary chases and cavities blocked out for utilities and panel connections
5. Mycelium material placed in frame and water is introduced to begin growing process
6. Mycelium material grows within the panel’s metal framework
7. The mycelium partially digests the wood braces, creating a solid tensile connection
Panel Construction
The site approach follows a mycelium growth pattern adapted to topographical conditions; this analysis forms 5 separate nodes throughout the site, which translate into congregational spaces. Triangulating the site's topography acts as a geometric and inorganic tool to express the organic character of the site. Combining these two analyses creates a site use delineation that takes triangulated form but also aligns with the site's contours.
Environmental Studies
Building canopies prefabricated at Keystone Prefabricated Structures with wood from Tague Lumber.

Pedestrian paths made of Pavegen outdoor tiles, providing energy to surrounding homes to offset costs.

Houses are sited around Econol pumps throughout the site. Mushroom growth below building platforms and in greenhouses give off gases that convert to biofuel, which can be used in place of fossil fuels in homes and the community.

Concrete building platforms are cast in place by Delaware Valley Concrete. The forms include platforms for homes, community buildings, public spaces, and water collection troughs.

Vehicle paths throughout the site made of stabilized gravel, which allows stormwater runoff to permeate the site and flow downhill. COREgravel stabilized gravel products are environmentally-friendly and can support vehicular loads.

Public structure for distribution of water collected from rooftop and platform runoff. Precast troughs in platform structures funnel water downhill toward collection points.
Econol pumps throughout the site contain biofuel byproduct of mushroom growth at each house. Community members can fuel cars and other machinery at the pumps.

Community amenities include a daycare, a public gathering area for picnics and meetings, a stage for concerts and events, and a communal gardening shed.

Public structure for distribution of water collected from rooftop and platform runoff. Precast troughs in platform structures funnel water downhill toward collection points.

The northeast edge of the site borders a public wildlife trail.

Areas throughout the site are designated for use by community members to cultivate flowers, fruits, and vegetables.
PARTIAL FLOOR PLAN
SCALE: 1" = 8'-0"

FLOOR PLAN DETAIL
SCALE: 1" = 2'-0"

MYCELIUM WALL PANELS
mycelium material fills its form, growing a root matrix as it digests cellulose fiber in its substrate

DARK GREENHOUSE
each home has a dark, sheltered greenhouse that captures the hydrocarbons produced by the mycelium as it digests cellulose

GAS PIPES
pipes inside the greenhouse collect the hydrocarbons from inside the dark greenhouse and funnel it toward centralized ecancal pumps, where it is converted into usable fuel for combustion engines

CONCRETE PLATFORMS
cast in place concrete platforms, supported by columns, mediate site slopes to provide flat areas for indoor and outdoor living space

BUILDING CANOPIES
prefabricated building canopies respond to specific site conditions, shaping wind, sun and water to provide ideal for mushrooms and residents

WATER COLLECTION TROUGHS
cast in place concrete troughs, covered with wood grates, capture stormwater runoff from building roofs and platforms and direct it to a central collection facility
EAST ELEVATION

SCALE: 1"=5'-0"
NORTH ELEVATION
PREFABRICATED WOOD CANOPIES
Locally prefabricated building canopies keep the elements away from the modular home and enclose indoor-outdoor living areas on the concrete platforms. The surfaces of the canopies fold to shape wind, sun and water to the advantage of human and mushroom growth.

CAST IN PLACE CONCRETE PLATFORMS
Cast in place concrete platforms provide a flat surface for the construction of homes and shade the area underneath for mushroom growth. These platforms provide space for indoor and outdoor living areas throughout the site.

EXTERIOR MYCELIUM PANELS
Exterior mycelium panels form the structure, insulation, and finish materials for the homes.

POLYCARBONATE ROOFING
Low-cost, lightweight roofing protects against moisture and allows diffuse sunlight to reach all parts of the home.

DARK GREENHOUSE
Polycarbonate walls enclose "dark greenhouses," where select mycelium panels are allowed to continue growing mushrooms after they are in place. While the mushrooms grow, the walls of the greenhouse capture the hydrocarbon produced by the mycelium for continuous energy production.

HYDROCARBON COLLECTION PIPES
Pipes inside the greenhouse and under the concrete platform collect the hydrocarbons produced by mushroom growth and funnel it toward centralized Econol pumps, where it is converted into usable fuel for combustion engines.

CAST IN PLACE CONCRETE PLATFORMS
Each in place concrete platforms provide a flat surface for the construction of homes and shade the area underneath for mushroom growth. These platforms provide space for indoor and outdoor living areas throughout the site.

OVERFLOW DRAINS
Drains in the water troughs allow excess water to be filtered out under the platforms and provide mushrooms with the moisture and humidity they need to grow.

WATER COLLECTION TROUGH
Water collection troughs are precast between the concrete platforms and direct rainwater from building canopies and platforms toward a central water collection facility.
BUILDING SECTION AND PASSIVE SYSTEMS
I want to introduce you to a group of about 10,000 people that live 3 hours from here. They are the mushroom farmworkers of Kennett Square, Pennsylvania, which is known as the mushroom capital of the world. 98% of these people are migrant workers from Mexico and South America who come here chasing the American dream. They leave their farms back home and come to Kennett Square because of the consistency of the mushroom farming industry. Mushrooms grow in very specific indoor conditions and the growing season is 24 hours a day, 7 days a week, and 365 days a year. This consistency draws family-oriented workers who are looking to improve their lives and their futures for their family.

Although mushroom farms in Kennett Square produce half of America's mushrooms and the agribusiness is booming, these workers barely make enough money to support themselves, let alone send money back home to their families. They end up staying, on average, 7-21 years. As one worker said, they live in “near homelessness” outside of Kennett Square with long commutes on broken-down school buses. These people do 60 hours of physical labor a week, sometimes getting to work as early as 4AM. They allow Americans to have access to one of the most nutritious vegetables, but they don’t have access to the benefits they cultivate for others.

Mushroom farmworkers deserve to thrive, not just to exist from day to day on minimum wage. They deserve to cultivate their lives in the place that they have made great, to lay down roots and create a community for the time that they live in Kennett Square. Inequity in land, construction, and material costs makes dignified living impossible for these workers and tons of others throughout our country. Architects like Michael Pyotak have been addressing this issue by incorporating income-producing aspect to housing projects. Building an affordable, low-cost, low-maintenance housing complex is not enough. That is not a sufficient solution for people who deserve to have more than “just enough.” We need to design an architecture that can subsidize a dignified lifestyle. Architects have the power to intervene in social inequity and to create more than just a building with a single program.

The solution to this problem lies in the science of the mushroom. New science is coming out everyday about the architectural possibilities of mushroom materials. When a mushroom grows, it digests the cellulose in the organic matter that it grows in (usually compost or soil) and creates what we call mycelium. Mycelium is a small but strong network of white fibers that is usually underground. This root structure strengthens the mushroom and roots it in the surrounding soil.

When mushroom spores are combined with agricultural waste and water and grown in specific climatic conditions, they can create a structural architectural material.
What I am proposing is standardized 4x8 panels of mycelium materials, which acts as structure, insulation, and finish materials in the homes. Because the panels can grow so fast, residents can literally grow extra rooms for their home as their family grows.

Building material isn’t the only thing that mushrooms have to offer. Paul Staments, a prominent mycologist, is conducting research connection mushrooms with antiviral and anti pathogenic qualities. In the future, mushrooms will be able to improve human health and environmental sustainability. When the mycelium grow and digest cellulose, they give off hydrocarbons that are the building blocks of fuel. If these gases are captured, they can be combined to create fuel for combustion engines. Lastly, mushroom growth stabilizes and revitalizes natural soils. So, by growing mushrooms on this site, residents are quite literally leaving the site better than they found it.

This is a viable solution for the mushroom farmworkers of Kennett Square, because they already have the skills they need to cultivate mycelium materials. By combining the knowledge and motivation of the farmworkers with the material possibilities of the mushroom, I have created a model for an architectural ecosystem where people and mushrooms can grow together to create a new way of life.

My building strategy takes root in the dependent relationship between the farmworker and the crop. When these two parts are working together, they form a relationship that is greater than the sum of its parts. The human part of the project relates to the economy of the small house. I have created economical, elegant homes that allow families to grow and evolve. The modular homes sit on platforms that navigate the sloping site. These modular structures sit beneath a prefabricated building canopy, which relates to the more organic nature of the mushroom. The canopy shapes the sun, wind, and rain to work together with the home so the mushrooms can grow to their fullest potential. Together, these two parts create a fully functioning ecosystem. Humans and mushrooms require opposite conditions to thrive, so they are positioned together to make the most of that. As you can see, mushrooms grow under the platform and in a “dark greenhouse” on the dark side of each home. The gases from this continuous mushroom growth flow through pipes toward central Econol pumps, where the hydrocarbons are converted into biofuel. Water from the canopies flows down into precast troughs between each house, which provides the mushrooms with the moisture they need to grow, and allows the homes to stay dry. These trough structures meet at central water collection facility.
This is not just a “feel good,” “give back to the community” sense of betterment. This is a new way for architecture to address inequity in our industry. These people have viable skills, and they can use them to make their lives tangibly better. They grow materials for home expansion and by just living in these homes and using their skills, they are creating biofuel. They can give back to the community by creating a new industry of environmentally friendly building products and fuel sources.

The possibilities for the future of this strategy are endless. Hard-working, deserving people can have access to the things they pictured in their American dream. They can literally create equity that will make their lives better. And then, they can build that equity and access for others.
Atelier Phileas. 131 Units of Migrant Workers Housing, Rue du Retrait, Paris. 2016


Ban, Shigeru. Paper Log House India. Bhuj, India. 2001


DesignCorps. Mushroom Worker Housing. Chester County, Pennsylvania. 2002


Guérin & Pedroza architectes. BONDY. Seine-Saint-Denis, France. 2013.


Zigzag Arquitectura. Vivazz Mieres Social Housing. Asturias, Spain. 2010
KATHERINE JOHNSON
ASPENDING ARCHITECT

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EDUCATION
The Pennsylvania State University, State College, PA
Schreyer Honors College
Bachelor of Architecture, Class of 2016
- Thesis: Cultivated Justice: A Model for Place-Based Community Building
  Advisor: Darla Lindberg
- Architectural History Minor
- Art History Minor
- Digital Beehive instructor and webmaster
- AIAS Treasurer, 2012-2013
- Developed First-Year Mentorship Program
- Research in architecture and social theory
- National Society of Collegiate Scholars
- National Society of Leadership and Success
- Third place in AIAS Photography Contest
- A cappella group section leader

The Pantheon Institute, Rome, Italy
One Semester: International Urban Design Studio

Newark Academy, Livingston, NJ
High School Diploma, Class of 2011
International Baccalaureate Program Diploma
3.97 Graduating GPA
- Cum Laude Society
- National Merit Scholarship Award Recipient
- Student Member of Architectural Design Board for school addition

PROGRAM PROFICIENCIES
Revit
Hand Drawing
Adobe Suite
Microsoft Suite
AutoCAD

Laser Cutting
Rhino
SketchUp
Photography

EXPERIENCE

NK Architects, Morristown, NJ
Summer 2015 | Architectural Intern
- Main project: university lab sciences building
- Programs used: Revit, Photoshop, SketchUp, Illustrator
- Revit: Family modeling and design development drawings
- Compiled drawing packages for planning board meetings
- Produced renderings in Photoshop
- Created SketchUp models for 3D images
- Schematic Design proposals
- Created submission for North Jersey AIA Competition

The Pittsburgh Project, Pittsburgh, PA
Summer 2014 | Worksite Liaison
- Project leader at a non-profit service camp
- Taught home improvement and construction skills to volunteers
- Worked on homes of 30 vulnerable homeowners in Pittsburgh
- Organized work supplies and materials for jobs
- Improvements included: roof repairs, door and window replacements, flooring installation, and plumbing
- Led small group discussions

Meridian Design Associates, New York, NY
Summer 2013 | Architectural Intern
- Assisted head interior designer on client calls and site visits
- Produced millwork drawings in AutoCAD
- Developed construction documents in ArchiCAD
- Specified interior finishes

Summer 2011 | Observation
- Shadowed project managers for high school senior project
- Learned ArchiCAD and digital architectural standards.

David B. Johnson, Professional Engineer, Dover, NJ
Summer 2009 - 2013 | CAD Operator & Field Assistant
- Produced site plans and deep foundation system details
- Took site measurements and documented existing conditions
- Compiled project packages and applied for building permits